REMARKS

By the subject Amendment, Applicants have amended Claims 29, 32, 40 and 46. Accordingly, Claims 1 to 7, 10 to 18 and 21 to 46 are pending herein. Claims 1, 10, 21, 25, 27, 29 and 32 are presented in independent form.

Claims 29 and 32 have been amended to add the word "is" solely for grammatical purposes. This amendment does not in any way narrow the scope of these claims.

On April 17, 2007, Applicants' representative conducted a personal interview with Examiner Kasenge. Regarding the rejection of Claims 29 to 36, 38, 39, 41, 42, 44 and 45 under 35 USC § 112, first paragraph, Applicants' representative explained that the Specification as originally filed clearly supports the "continuous loop fluid circuit" claim recitation. The Examiner's attention was directed to Figure 1 that unquestionably depicts a continuous loop fluid circuit including reservoir 2, pump 1 and flow control device 7. (See arrows in Figure 1). Applicants' representative also explained that Maus et al. (i.e., U.S. Patent No. 6,668,943) fails to teach or suggest the claimed invention. In this regard, certain deficiencies in Maus et al. were pointed out. Specifically, Maus et al. is not concerned with releasing pressurized fluid from a conduit via a flow control device to *maintain* the flow of pressurized fluid within predetermined limits. On the contrary, Maus et al. is concerned with maintaining the pressure at the base of the riser at a desired value (i.e., approximately equal to the ambient seawater pressure at the base of the riser) despite variations in the flow rate and/or density of the well return. (See Maus et al., col. 4, lines 21 to 27 and col. 7, lines 49 to 51). According to Maus et al., the pressure control system of his patent comprises two complimentary parts. The first element *adjusts* the pressure at the surface and the mass flow rate out of the top of the riser to compensate for changes in riser base pressure due to variations in the mass flow rate entering the

riser. (See Maus et al., col. 4, lines 31 to 35) The second element adjusts either or both of the boost mud and the lift gas flow rate entering the riser. (See Maus et al., col. 4, lines 35 to 39) Hence, Maus et al. is not concerned with maintaining the flow in a conduit within predetermined limits by releasing a pressurized fluid from the conduit. The Examiner indicated that Applicants' representative's arguments appeared valid, but further consideration was necessary to confirm the validity of the arguments.

Applicants respectfully request that the rejection of Claims 29 to 36, 38, 39, 41, 42, 44 and 45 under 35 USC § 112, first paragraph be withdrawn. As explained above, the Specification clearly supports the continuous loop fluid circuit claim recitation. See for example the continuous loop fluid circuit including reservoir 2, pump 1 and flow control device 7 depicted by the arrows in Figure 1. This disclosure in the drawings as originally filed is more than enough to satisfy the written description requirement of 35 USC § 112, first paragraph. See *Vas-Cath Inc. v. Mahurkar,* 935 F.2d 1555, 1564 (Fed. Cir. 1991)("[D]rawings alone may be sufficient to provide the 'written description of the invention' required by § 112, first paragraph."); see also *Koto Manufacturing Co., Ltd. v. Turn-Key-Tech, LLC,* 381 F. 3d 1142, 1155 (Fed. Cir. 2004)("In the present case, Figure 1 of the '268 patent clearly shows that flow channel 6 is 'significantly thicker and wider' than the adjacent mold cavity 2. Figure 1 thus demonstrates that the inventor was 'in possession' of the patent claims, including the claim limitation speaking to the relative dimensions of the flow channel, and thus that the written description requirement was satisfied.")

Applicants note that independent Claims 29 and 32 and the claims that depend therefrom are not presently rejected on prior art. Accordingly, these claims are now in condition for allowance.

Claims 40 and 46 have been amended to depend from claims that provide antecedent basis

for the phrase "said controller." Accordingly, Applicants respectfully request that the rejection of Claims 40 and 46 under 35 USC § 112, second paragraph be withdrawn.

The Official Action rejected Claims 1 to 4, 7, 10 to 16, 21 to 28, 37 and 43 as allegedly being anticipated by Maus et al. under 35 USC § 102. Claims 5, 6, 17 and 18 have been rejected under 35 USC § 103 as allegedly being obvious in view of Maus et al. and Harpster (i.e., U.S. Patent No. 4,942,763. Applicants respectfully traverse these grounds of rejection for at least the following reasons.

Applicants' invention, as recited in Claim 1, is directed to an apparatus to control *the rate of flow of a stream of pressurized fluid through a conduit.* The apparatus includes *a flow measurement device* for generating an output signal proportionate to *the rate of flow of the fluid* there through. The flow measurement device is operatively connected to the conduit. A flow control device is operatively connected to the conduit downstream of the flow measurement device. The flow control device includes an adjustable orifice wherein upon the opening of the orifice a portion of the stream of pressurized fluid is independently released from the conduit by the flow control device. A controller is operatively connected to the flow control device for receiving the output signal generated by the flow measurement device *and for causing the adjustable orifice in the flow control device to open or close as necessary to maintain the flow of pressurized fluid as measured by the flow measurement device within pre-determined limits.*

Maus et al., taken alone or in combination, does not anticipate nor render obvious Applicants' invention, as recited in Claim 1. As Maus et al. states:

> The present invention is a method and apparatus for controlling the pressure at the base of a gas-lifted riser during drilling of an offshore well. Preferably, the internal pressure at the base of the riser should be maintained approximately equal to the ambient

> seawater pressure at that depth despite variations in the flow rate and/or density of the well return flow. (See Maus et al., col. 4, lines 21 to 23)

According to Maus et al., the riser base pressure is maintained at approximately the ambient seawater pressure at that depth by "two complimentary control elements." (See Maus et al., col. 4, lines 30 to 31). "The first element *adjusts* the pressure at the surface *and the mass flow rate* out of the top of the riser to compensate for changes in riser base pressure due to variations in the mass flow rate entering the riser." (See Maus et al., col. 4, lines 31 to 35)(emphasis added) More specifically, a throttling device, such as a pressure control valve 66 manipulates both the mass flow out of the top of the riser and the pressure at the top of the riser to maintain the riser base pressure at its desired value. (See Maus et al., col. 8, lines 55 to 61) If the riser base pressure decreases as a result of a decrease in the mass flow into the riser, the pressure controller 68 will cause the pressure control valve 66 to close in order to increase the riser base pressure to compensate for the change in mass flow into the riser. (See Maus et al., col. 8, lines 61 to 65) The closure of the pressure valve 66 will also cause a decrease in the mass flow out of the riser because it restricts flow out of the riser. (See Maus et al., col. 8, lines 65 to 67) If the mass flow into the riser increases, the pressure controller 68 will cause pressure control valve 66 to open in order to increase the mass flow out of the riser and decrease pressure at the surface of the riser to compensate for an increase in the mass flow into the riser. (See Maus et al., col. 8, lines 67 to col. 9, line 4)

The first element of Maus et al. *must adjust the flow* through the riser to maintain the riser base pressure at the desired value. This is directly contrary to Applicants' invention as recited in Claim 1. More specifically, Claim 1 recites a controller operatively connected to a flow control device to open and close the flow control device to *maintain* the flow of pressurized fluid within

predetermined limits.

The second control element of Maus et al. adjusts either or both of the boost mud flow rate and the lift gas flow rate to maintain a substantially constant mass flow rate entering the riser. (See Maus et al., col. 4, lines 36 to 39) Both the boost mud and the lift gas are *injected into the riser*. (See col. 6, lines 54 to 56) This again is at direct odds to Applicants' invention as recited in Claim 1. More specifically Claim 1 recites a flow control device for *releasing* (as opposed to injecting as taught by Maus et al.) pressurized fluid from the conduit and a controller operatively connected thereto to open and close the flow control device to maintain the flow of pressurized fluid within pre-determined limits.

The foregoing makes abundantly clear that Maus et al. does not anticipate Applicants' invention as recited in Claim 1. Claims 2 through 7 and 35 through 37 depend from Claim 1 and, therefore, are allowable for at least the reasons that Claim 1 is allowable.

Applicants' invention, as recited in Claim 10, is directed to an apparatus to control the rate of flow of pressurized fluid through a conduit connected to a pump. The apparatus permits the discharge of fluid from the conduit at a rate below the output rate of the pump. The apparatus comprises a flow measurement device for generating an output signal proportionate to the rate of flow of the fluid there through. The flow measurement device is operatively connected to the conduit. *An adjustable flow control device permits a portion of the pressurized fluid to be independently released from the conduit to maintain the flow of pressurized fluid as measured by the flow measurement device within pre-determined limits.* The flow control device is operatively connected to the conduit downstream of the flow measurement device.

Maus et al., fails to teach or suggest, *inter alia* an adjustable flow control device that

permits a portion of pressurized fluid to be independently *released* from a conduit to *maintain* the flow of pressurized fluid within predetermined limits. As previously explained, the first control element of Maus et al. must *adjust* (not maintain) the flow through the riser to maintain the riser base pressure at the desired level. The second control element of Maus et al. *injects* (not release) either or both of the boost mud and the lift gas into the riser.

Applicants respectfully submit that Claim 10 patentably defines over the prior art of record. Claims 11 to 18 and 38 to 40 depend from Claim 10 and, therefore, are allowable for at least the reasons that Claim 10 is allowable.

Applicants' invention, as recited in Claim 21, is directed to a method of controlling the rate of flow of a stream of pressurized fluid through a conduit. The method comprising the steps of: (i) with a flow measuring device determining the rate of flow of fluid through a portion of the conduit and generating a signal proportionate to the fluid flow rate; (ii) directing the signal to a controller operatively connected to a flow control device, the flow control device operatively connected to the conduit downstream of the portion of the conduit and including an adjustable orifice wherein upon the opening of said orifice a portion of the stream of pressurized fluid is independently *released* from the conduit by said flow control device; and, (iii) with the controller, comparing the signal to a pre-determined value and activating the flow control device to open or close said adjustable orifice as necessary *to maintain the flow of pressurized fluid as measured by the flow measurement device within pre-determined limits.*

Maus et al. does not teach or suggest Applicants' invention as recited in Claim 21. The first control element of Maus et al. must *adjust* fluid flow through the riser to maintain the riser base pressure at the desired value. The second control element of Maus et al. *injects* (not release)

boost mud and/or lift gas into the riser.

Claim 21 is clearly patentable. Claims 22 to 24 and 40 to 42 depend from Claim 21 and, therefore, are allowable for at least the reasons that Claim 21 is allowable.

Applicants' invention, as recited in Claim 25, is directed to a method to control the rate of flow of pressurized fluid through a conduit connected to a pump. The method permits the discharge of the fluid from the conduit at a rate below the output rate of the pump. The method comprises the steps of: (i) with a flow measurement device determining the rate of flow of fluid through a portion of the conduit and generating a signal proportionate to the fluid flow rate; and, (ii) comparing the generated signal to a pre-determined value and activating an adjustable flow control device operatively connected to the conduit, downstream of the portion of the conduit, to permit a portion of the pressurized fluid to be independently *released* from the conduit to *maintain the flow of pressurized fluid as measured by the flow measurement device within predetermined limits*.

As previously explained, Maus et al. fails to teach of suggest maintaining the flow rate within predetermined limits by releasing a portion of the pressurized fluid from the conduit. As such, Claim 25 is clearly patentable. Claims 26 and 44 to 46 depend from Claim 25 and, therefore, are allowable for at least the reasons that Claim 25 is allowable.

Applicants' invention, as recited in Claim 27, is directed to an apparatus to control the rate of flow of pressurized fluid through a conduit connected to a discharge of a pump which draws fluid from a reservoir. The apparatus permits the discharge of fluid from the conduit at a rate below the output rate of the pump. The apparatus comprises a flow measurement device operatively associated with the conduit and for generating an output signal proportionate to the

rate of flow of fluid through the conduit. An adjustable flow control device is operatively connected to the pump discharge downstream of the connection of the conduit to the pump discharge. The flow control device includes an adjustable orifice wherein upon the opening of the orifice a portion of the fluid from the pump discharge is independently released and returned to the reservoir.

Maus et al. does not teach or suggest, *inter alia,* an adjustable flow control device operatively connected to the pump discharge that includes an orifice that when open permits a portion of the fluid from the discharge pump to be independently released and returned to the reservoir.

Claim 28 depends from Claim 27 and, therefore, is allowable for at least the reasons that Claim 27 is allowable.

Applicants respectfully submit that the subject patent application is in condition for allowance. Accordingly, it is respectfully requested that the subject patent application be passed to issuance without delay.

It is believed that no fees are due. However, should that determination be incorrect, the Commissioner is hereby authorized to charge any deficiencies to Deposit Account No. 50-0562 and notify the undersigned in due course.

Respectfully submitted,

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